Manistee County Board of Commissioners

Manistee County Courthouse • 415 Third Street • Manistee, Michigan 49660

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MANISTEE COUNTY
GREEN TEAM/RECYCLING COMMITTEE

Friday, September 4, 2009
1:30 P.M.

Manistee County Courthouse & Government Center
Board of Commissioners Meeting Room

AGENDA

1) 1:30 P.M. - Big Fish Environmental - John Campbell (www.bigfishenvironmental.com)

2) 2:00 P.M. - Recycling Update - Mary Pitcher

3) Recycling PowerPoint - Kershaw County, South Carolina

4) Energy Fair Thank-You's & Update

5) Fairgrounds Update

6) Heat Recovery Systems (APPENDIX A)

7) Grant Possibilities - EECBG

8) Other Items from Committee Members

9) Adjournment

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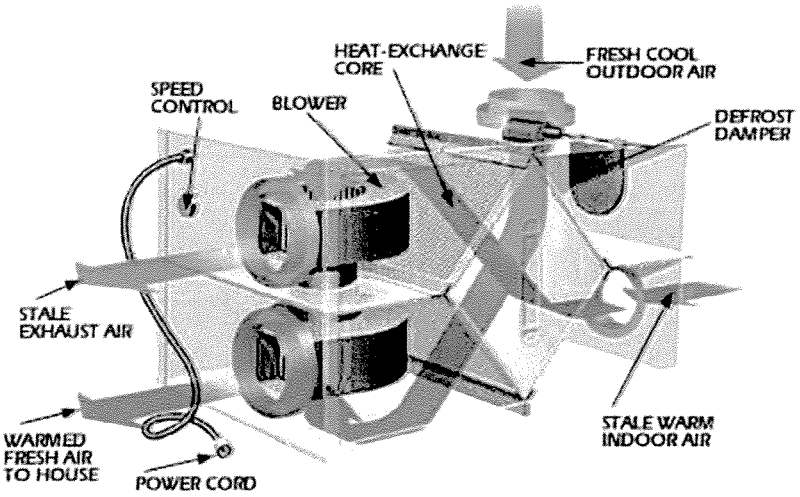
APPENDIX A

How It Works: Heat Recovery Ventilator

A simple device that keeps heat in while moving stale air out.

BY THOMAS KLENCK
Illustrations by George Retseck
Published in the August 2000 issue.

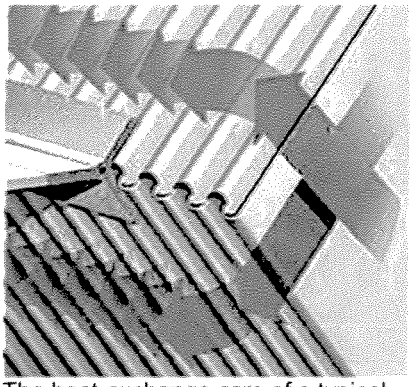


A residential heat-recovery ventilator uses separate blowers to move incoming fresh and outgoing stale air. The heat-exchange core transfers heat to fresh air without mixing the airstreams. The damper automatically stops cold air for defrosting.

While necessity may be the mother of invention, it's increasing costs that spawn efficiency. Before the '70s, we happily cranked up the thermostat when the house felt chilly. Once heating costs went through the roof, though, we all put on sweaters and started looking for ways to save. And, with up to 40 percent of our heating dollar going to air infiltration--otherwise known as drafts--sealing the place up began to seem like the best defense against high heating bills.

Over a period of time, older homes began to sport new, tight windows and doors, insulation and vapor-barrier improvements, modern siding, and caulk for every crack through which air might pass. New homes left the drawing board designed to be tight, and builders became familiar with the new materials and skills needed to meet market demand and updated regulations. Homes were finally becoming thermally efficient. What some began to wonder, though, was whether they were habitable.

It turns out that those heat-robbing drafts had a role in the ecosystem of the home--they provided fresh air to breathe. Without realizing it, builders before the energy crisis had been installing an effective, albeit haphazard, ventilation system. If you could afford the heating bills, it worked.



The heat-exchange core of a typical HRV is made up of thin aluminum passages. Incoming and outgoing airstreams flow in alternate passages. Heat is transferred from warm stale air to cool air.

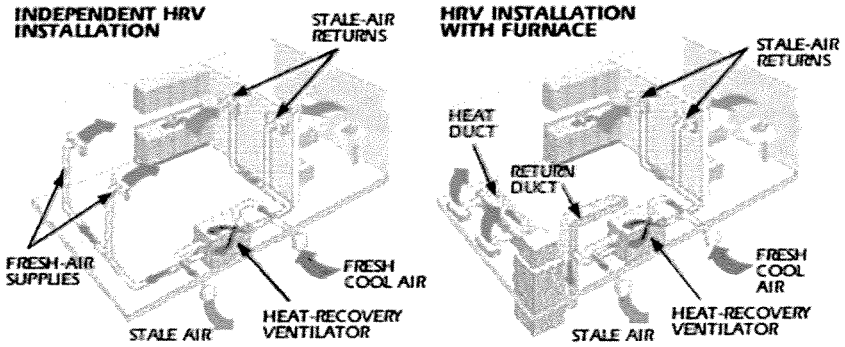
Why Ventilate?

Life inside today's tight home generates both moisture and pollutants. The moisture comes from cooking, washing, showers and breathing. At excessive levels, moisture condenses on windows and can cause structural deterioration. Areas of excessive moisture are also breeding grounds for mold, mildew, fungi, dust mites and bacteria. You know you have a

problem if you find moisture collecting on your windows, or if you notice black spots on walls. These unsightly spots indicate mildew growth. Mold spores and dust easily become airborne and circulate freely throughout the house, possibly causing a range of symptoms and allergic reactions.

In addition to excessive moisture and biological contaminants, appliances that utilize combustion have the potential for allowing gases, including carbon monoxide, and other pollutants to escape into the air. Some common sources may include gas ranges and water heaters, unvented space heaters, leaky chimneys and wood-burning appliances. Even breathing can add to the problem when carbon dioxide reaches excessive levels, creating stale air.

And that's not all that gets into the air. If your home is new, the very products it's made of can give off gases that are less than agreeable to your comfort and good health, and in many areas of the country there's a concern about radon seeping from the ground.



A heat-recovery ventilator is generally installed in the basement and connected to air-supply and air-return vents through ductwork (left). Exterior supply and return hoods must be separated. In a forced-air heating system, the HRV unit can be connected into the existing ductwork. Here, the fresh airstream enters the heating system through the furnace-return duct (right).

Open A Window?

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) sets the standard for residential ventilation at a minimum of .35 air changes per hour, and not less than 15 cubic feet per minute (cfm) per person. An old home may very well exceed these values--especially on a windy day. However, on a calm winter day, even a drafty house may fall below the recommended minimum ventilation standard.

There are partial solutions to the indoor air-quality problem. For example, an electrostatic filter installed in a forced-air heating system will reduce airborne contaminants, but it won't help with moisture, stale air or gaseous pollutants. And, local exhaust fans can remove excess moisture in the kitchen, bath and laundry area, but create negative pressure inside the house. As they pump air out, the resultant vacuum slowly draws air into and through the house structure, bringing with it odors, dust and contaminants. In areas where radon is a problem, the negative pressure may increase radon levels.

A better whole-house solution is to create balanced ventilation. This way, one fan blows the stale, polluted air out of the house while another replaces it with fresh. Of course, if the fresh air is cold, you need to warm it up, and that costs money.

Holding The Heat

A heat-recovery ventilator (HRV) is similar to a balanced ventilation system, except it uses the heat in the outgoing stale air to warm up the fresh air. A typical unit features two fans--one to take out household air and the other to bring in fresh air. What makes an HRV unique is the heat-exchange core. The core transfers heat from the outgoing stream to the incoming stream in the same way that the radiator in your car transfers heat from the engine's coolant to the outside air. It's composed of a series of narrow alternating passages through which incoming and outgoing airstreams flow. As the streams move through, heat is transferred from the warm side of each passage to the cold, while the airstreams never mix.

Depending on the model, HRVs can recover up to 85 percent of the heat in the outgoing airstream, making these ventilators a lot easier on your budget than opening a few windows. And, an HRV contains filters that keep particulates such as pollen or dust from entering the house. You will, though, find your energy bill going up slightly to pay for replacing the heat that isn't recovered. An average HRV installation can run from $2000 to $2500, but costs will vary widely depending on the specific situation.

Although an HRV can be effective in the summer months, when it will take heat from incoming fresh air and transfer it to stale air-conditioned exhaust air, it's most popular in colder climates during the winter. If the temperature falls below about 20° F, however, frost can build up inside the exchange core. To handle this, a damper closes off the cold airstream and routes warm air through the core. After several minutes, a timer opens the fresh-air port and ventilation continues.

A typical HRV for residential use might move as much as 200 cfm of air, but the fan speed can be set to suit the air quality in the home. For example, a slow to medium fan speed may be adequate for normal living, while a house full of guests might require the highest setting. Controls are available for intermittent and remote operation.

HRVs are ideal for tight, moisture-prone homes because they replace the humid air with dry, fresh air. In climates with excessive outdoor humidity, an energy-recovery ventilator is more suitable. This device is similar to an HRV, but dehumidifies the incoming fresh airstream.

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Fantech

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Improving Indoor Air Quality Through Better Ventilation

Product Lines: ALL PDF

- Inline Duct Fans
- Dryer Booster Fans
- Exterior Fans
- Exhaust Fans
- Axial Fans
- Radon Fans
- Whole House HEPA Filtration
- Heat Recovery Ventilators
- Energy Recovery Ventilators
- Air Curtains
- Grilles & Dampers
- Accessories

Heat & Energy Recovery Ventilators

Fantech Provides Ventilation Solutions To Improve Indoor Air Quality

Indoor air quality problems have soared since the late 1970's when construction technology succeeded in developing energy efficient "tight" houses. Pollutants inside houses, which once escaped through cracks around windows and doors, are now trapped inside creating an indoor environment that is often 2 to 5 times more polluted than outside. Pet dander, mold spores, dust mites, allergens, tobacco smoke and other pollutants add up to poor indoor air quality.

Fantech's new line of IAQ Products can help you solve these problems through better ventilation. Choose from a complete line of Heat Recovery and Energy Recovery Ventilators to bring fresh outside air into the house while expelling stale polluted air.

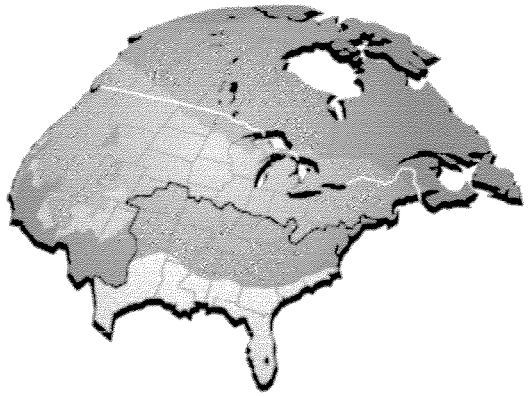
Discover the benefits of Fantech's new Whole House HEPA Filtration unit that can be easily installed on a furnace/air handler or used as an independent system to clean the air in an average size house once each hour.

Each Fantech IAQ Product is designed using state-of-the-art technology and quality components to give you long life and dependable operation. We guarantee it.

Selecting The Right Unit

The climate conditions where you live will determine whether you need a Heat Recovery Ventilator or an Energy Recovery Ventilator.

HRV's are usually recommended for colder climates with longer heating seasons. ERV's are used for warmer more humid climates with long cooling seasons. Use map for reference.



*Note: When installing ERVs (in ERV areas according to the map), and the outdoor temperature falls below 23°F (-5°C) for more than 2 consecutive days, it is recommended that a defrost option be installed on the equipment.

Sizing For Your Residential Needs

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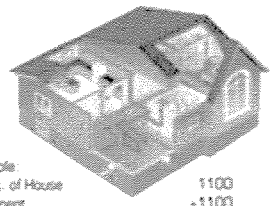
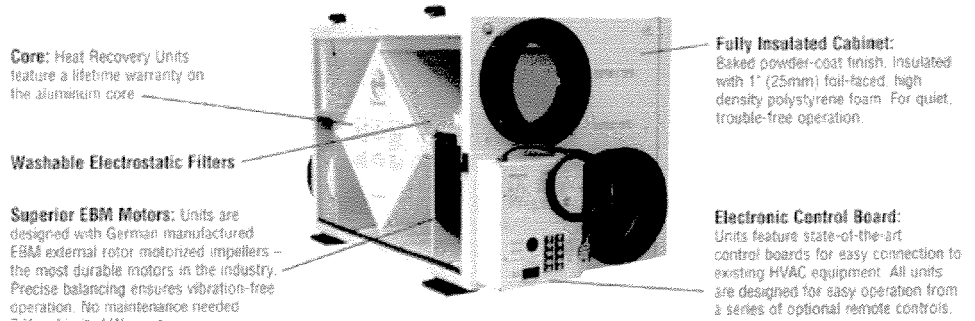
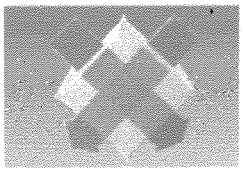
HRVs/ERVs are typically sized to ventilate the whole house at a minimum of .35 air changes per hour. To calculate, simply take the square footage of the house (including basement) and multiply by the height of the ceiling to get cubic volume. Then, divide by 60 and multiply by .35.

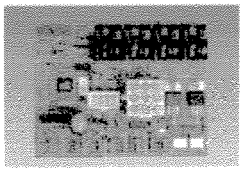


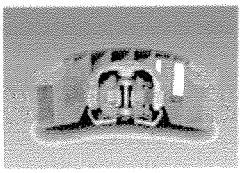
Example	
Sq. Ft. of House	1100
Basement	+1100
Total Sq. Ft.	2200
Height of ceiling	x 8
Cubic volume	17600
Minutes per hour	÷ 60
	293
Minimum air changes	x 0.35
Minimum airflow required (CFM)	103

** Always consult your local code for sizing requirements in your area.*









THE HEART OF THE SYSTEM

Fantech HRVs (like the unit shown above) feature aluminum heat exchanger cores.

- In the heating season the core transfers heat from the outgoing, stale household air to preheat the incoming, fresh air.
- Cross-current sections, ensure the two air streams are always kept separate preventing the incoming fresh air from being contaminated by the outgoing stale air.
- During the air-conditioning season, the HRV reverses this process, removing some of the heat from the incoming air and transferring it to the outgoing air.

Fantech ERVs, which are ideal for warmer climates, use enthalpic cores to transfer both heat and moisture.

- Reduces indoor humidity in the air conditioning season.
- Maintains a comfortable humidity level in the home in the heating season.

ELECTRONIC CONTROL BOARD

Fantech Heat Recovery and Energy Recovery Units have been designed with new "high tech" electronic control boards. Features include:

- Accessory control contact allows the ventilator to connect to other equipment such as an existing forced air system to trigger the furnace blower motor to turn on and off on demand.
- A diagnostic LED
- Allows units to be easily operated from a remote Intellitek Multi-Function Wall Control.

CHOICE OF DEFROST MODE

The defrost mode activates when the temperature of incoming air is below 23°F (-5°C). Two types are available:

HRV without recirculation

- Features an automatic timed supply fan "shutdown".

HRV with recirculation uses a motorized damper to temporarily block incoming fresh air allowing the warm air from the house to circulate through the HRV.

- Maintains equal house pressure.
- Does not introduce household odors back into the home.

FACTORY-BALANCED EBM MOTORS

Fantech HRVs and ERVs use superior German-manufactured, factory-balanced EBM motors.

- Vibration is reduced to a minimum providing quiet operation.
- Permanently lubricated sealed bearings guarantee long life and maintenance-free operation.
- Typical life expectancy of motor is in excess of 100,000 hours.
- 7 year warranty (limited).

SUPERIOR WARRANTIES

Fantech HRVs and ERVs carry the following superior warranties:

Motor: 7 year (Limited)
Core (Aluminum): Lifetime (Limited)
Core (Enthalpy): 5 year (Limited)
Other Components: 5 year (Limited)

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• Provides positive shutoff of supply air when unit is in standby mode.

To download more information or a submittal sheet on these products, simply click on the product name or picture.

Indoor Air Quality **(1.56 Mb)**

Compact Series Sell Sheet in PDF **(107 kb)**

Ventilators

Heat Recovery Ventilators SH Series
SHR Series Heat Recovery Ventilators (2.21 Mb)
SH704 (121 kb)
SHR 1504 (143 kb)
SHR 2004 (143 kb)
SHR 1505R (169 kb)
SHR 2005R (166 kb)
SHR 3005R (174 kb)
SHR 3205RD (181 kb)

Heat Recovery Ventilators VH Series
VHR Specification Sheet (690 kb)
VH704 (104 kb)
VHR704 (126 kb)
VHR 1404 (120 kb)
VHR 2004 (121 kb)
VHR 1405R (139 kb)
VHR 2005R (138 kb)

Energy Recovery Ventilators SE Series
SER Specification Sheet (335 kb)
SE704N (168 kb)

Heat Recovery Cores HRC Series
HRC(M) Series (97 kb)

HEPA Filtration Systems
DM 3000P (204 kb)
DM/CM Series (219 kb)

Air to Air Exchanger

AEV Series **(3.27 Mb)**
Air Exchanger

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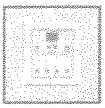
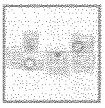
Accessories, Additionals

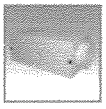
New HRV/ERV Controls **(277 kb)**



CONTROLS **(80 kb)**
Multi-Function Wall Controls



CONTROLS **(69 kb)**
Controls & Accessories



Filtration (Inline Filtration) **(128 kb)**
Installation Instructions for Model FB6

More Information

- SH704, VH704 & SE704 Installation Instructions (1.83 Mb)
- VHR704 Installation Instructions (711 kb)
- SHR & VHR Series Installation Instructions (916 kb)
- SER Series Installation Instructions (3.19 Mb)
- AEV Series Installation Instructions (346 kb)

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Click here for our Light Commercial HRV/ERV Series

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